



# **Institutional Status Review 580/Information Systems Center**

**September 22, 2000**



# AGENDA



- **TECHNOLOGY HIGHLIGHTS**
- **PARTNERING**
- **OUTREACH**
- **INSTITUTIONAL STATUS**
  - **Papers, Conferences, and Seminars**
  - **Personnel**
  - **IT Security**
  - **Facilities**
  - **Procurement**
  - **ISO 9000 QMS**
  - **Safety**
- **GOOD NEWS**
- **TOP ISSUES**



# ISC Technology Highlights



Technology Activity/Project	Customer	Lead Code(s)	Major Accomplishments/Highlights/Comments	Status			
				Tech Issues	Schedule Issues	Cost Issues	Staffing Issues
Flight Software (FSW)	Research & Technology	582	Todd Miller agreed to lead Branch initiatives to be accomplished on the FSW Technologies Test Lab. Early investigations will address POSIX compliant RTOSs and Linux in particular.				
	572	583	Initiated a joint development effort with Code 572 for an Attitude Contingency Tool, which will provide a quick-look visual representation of a spacecraft's attitude during an anomalous event.				
	SOMO	583	Received approval for a SOMO Technology proposal to develop a Constellation Management Automation system architecture over the next 3 years.				

Activity	Issue Code	Issue	Action



# ISC Technology Highlights



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ESDIS	423	583	Delivered Release C of the Aqua Flight Dynamics System (FDS). Also, the FDS operational hardware has been installed in the EOS Operations Center.				
Airborne Diode Array Spectrometer (ADAS)	972	584W	First deployment of ADAS very low noise spectrometers to observe coral spawn up-welling in Puerto Rico. Instrument developed by Code 584W.				
Flight Modem	840 Test Range	584	Flight Modem has been successfully demonstrated in terms of reliability and error immunity. Latency is being quantified. Test flights aboard aircraft (Dryden), High altitude balloon (Texas), and Sounding Rocket (Sweden) are being planned for later in CY00.				
	SOMO	580 All	Assisted in SOMO technology road mapping exercise, both at Greenbelt and Wallops, to insure that ISC goals are reflected in SOMO technology road maps.				

Activity	Issue Code	Issue	Action



# ISC Technology Highlights



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Global Legal Information Network (GLIN)	930	585	Live demo over satellite links of web-based front-end access to the database was presented at GSFC to 40 participants at the GLIN conference held at the Library of Congress. AETD technical support: Freemon Johnson, Kevin Kranacs, Lee Foster.				
Community Coordinated Modeling Center (CCMC)	696	587	Release Version 2 of Space Weather View (SWV) using IDL Object Graphics				
Visual Observation Layout Tool (VOLT)	Research & Technology	588	Completed the Release 2 prototype and presented it to management as well as STScI and FUSE.				
Scientist's Expert Assistant (SEA)	SOFIA/NGST/ESO	588	<ul style="list-style-type: none"> <li>Completed the initial design of the SEA Simulation Facility and produced a design document</li> <li>Identified two likely candidates for SEA simulation integration: NGST Mission Simulator (NMS) and ESO Spectroscopy Simulator</li> <li>Met with SOFIA leads resulting in SOFIAs decision to use the SEA</li> </ul>				

Activity	Issue Code	Issue	Action



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UoSAT-12		588	Collected packet trace data for successful FTP tests with UoSAT-12 after TCP performance modifications were installed; results were presented to the 154X working group at NASA GRC				
Advanced Fault Detection Isolation & Recovery/Cross Spacecraft Trend Analysis Tool (AFDIR/CSTAT)		581 588	<ul style="list-style-type: none"> <li>Completed and reviewed its Project Management Plan for design and development</li> <li>Completed a Mission Survey and Trend Analysis White Paper draft that proposes increased automation, better visualization, multiple S/C trending capability, and new Fault Detection Algorithms</li> </ul>				
Operating Missions as Nodes on the Internet (OMNI)	NASA HQ/CHIPS	588	<ul style="list-style-type: none"> <li>Provided key GSFC input to HQ for IP in Space Road Map</li> <li>Participated in a design review in San Diego for the CHIPS mission, which has adopted Internet protocols for spacecraft communications to and from the ground</li> </ul>				

Activity	Issue Code	Issue	Action



# ISC Technology Highlights



Technology Activity/Project	Customer	Lead Code(s)	Major Accomplishments/Highlights/Comments	Status			
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Proposals	GSFC IR&D/ Code 800/ NASA IS NRA	582, 584, 588	<p>Code 582</p> <ol style="list-style-type: none"> <li>1. Jerry Miller along with Code 584, submitted a proposal entitled, "Neural Network Fire Event Detection in Multiresolution Space" for Goddard's IR&amp;D solicitation</li> </ol> <p>Code 584</p> <ol style="list-style-type: none"> <li>1. "Real-time Collaborative Mission Management Tool for Emergency Access to ISS" proposal submitted as part of Code 800 IRAD Advanced Carriers Area</li> <li>2. "Ocean Color Modeling Using Analog Neural Network" proposal submitted to GSFC IRAD and NASA IS NRA</li> <li>3. "Wearable Computers" proposal submitted to NASA IS NRA</li> </ol>				

Activity	Issue Code	Issue	Action



# ISC Technology Highlights



Technology Activity/Project	Customer	Lead Code(s)	Major Accomplishments/Highlights/Comments	Status			
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Proposals (Con't)	SOMO Techonology Manager/ AISR	582, 584, 588	4. "Science Event Notification Networks" proposal submitted to ROSS 2000 AISR call 5. Proposals for "File Transfer Standard Protocol Prototyping", "IP Security" and "Constellation Visualization" submitted to SOMO technology manager Code 588 proposals submitted to AISR 1. Science data mining 2. Science peer review automation 3. Scheduling coordinated observations on multiple observatories 4. SEA simulation capability				

Activity	Issue Code	Issue	Action





## ISC Partnering



- Code 588/IRC hosted a meeting, September 7, 2000, with NIST and Royal Observatory of The University of Edinburgh, UK to discuss IRC and instrument software requirements
- Code 588/AFDIR/CSTAT met with representatives from HST, SMEX, GPS, NOAA GOES/POES, and GlobalStar projects to discuss current trending operations and determine future trending needs
- Code 588/IRC is providing software support for FIBRE interface test at the Caltech Submillimeter Observatory, Hawaii; IRC will meet with Caltech SHARC instrument builders to discuss potential software collaboration, September 19-24, 2000



## ISC Partnering



- Code 588/Continued partnerships with HST and FUSE on the VOLT project; VOLT appears to be a likely candidate module for APT system-FUSE agreed to be collaborator on the VOLT AISR proposal
- Code 588/AFDIR/CSTAT met with representatives from JPL to discuss applicability of existing fault detection research and development to CSTAT effort



## ISC Outreach



- Howard Kea/Code 581, mentored a summer student from the Polytechnic High School of Baltimore under the Summer High School Apprenticeship Research Program (SHARP)
  - The student designed and build the Code 581 Web site in only 8 weeks without any previous experience
  
- Bowie State received recognition from NASA Administrator Dan Goldin for their efforts in utilizing the BSOCC facility, which Code 581 sponsors, for teaching satellite operations as part of their computer science curriculum



## ISC Outreach



- Code 584W hosting two students from a local high school and provided tours
  - **Summer 00:**
    - Worked on web content development and ULDB database setup for Australia Test Flight
  - **Fall 00:**
    - Assisting in the transition of ADEOS2 documentation from paper to web-accessible and with ULDB database setup and end user testing
  - **Tour:**
    - A one day overview of 584W activities was provided to students from USRA-participating colleges



## ISC Outreach



- Code 584G hosted three summer students, one from the SIECA Program with Georgia Tech, one from Southern Adventist U and one from “High School, High Tech” Program
  - The college students assembled and demonstrated a wearable computer for potential Goddard clean room activities
  - The high school student created Web pages for Code 584



## ISC Institutional Status



### ➤ Papers, Conferences, and Seminars

- Dave McComas/582 presented a paper titled, “Addressing Variability in a Guidance Navigation and Control Flight Software Product Line” at the 1st Software Product-Line Conference (Product-Line Architecture Workshop)
- Steve Bailey/584W Co-authored a technical report, “Satellite Altimeter Models for Surface Wind Speed Developed Using Ocean Satellite Crossovers” Report No. IFREMER-DROOS-2000-02
- Lori Perkins/584G created visuals of Greenland that were featured in the August 7, 2000 issue of Space News



## ISC Institutional Status



- Papers, Conferences, and Seminars (Continued)
  - Mark Lupisella/584 attended the “Mars Replanning Workshop” at the Lunar Planetary Institute, Houston, TX in July 13-21, 2000
    - Chaired a session on “Missions and Future Perspectives”
    - Presented 2 papers titled “Cooperative Robotics and the Search for Extraterrestrial Life”, and “Mitigating Adverse Effects to Possible Martian Ecosystems”
    - Wrote the sample return section of the Goddard Mars Working Group Mars Replanning submission to HQ
  - Robin Pfister/586 presented the paper “A New Paradigm for Search and Order in EOSDIS” at the Data Standardization and Distribution session at the IEEE International Geoscience and Remote Sensing Symposium (IGARSS) 2000



## ISC Institutional Status



### ➤ Papers, Conferences, and Seminars (Continued)

- Robert Lutz/586 presented a paper titled, “A Review of EOS Terra Quality Assessment” in an interactive session at IGARSS 2000, Honolulu, HI, July 24-28, 2000
- Rich Ullman/586 hosted the 4th Annual Hierarchical Data Format Workshop
- Sandy Grosvenor/588 Contractor to the SEA Project presented a paper at the AISR Workshop in Boulder, CO, September 20-22, 2000
- Keith Hogie/588/CSC Contractor to the OMNI Project presented a paper titled “Internet Access to Spacecraft” at the AIAA/USU Small Satellite Conference in Logan, UT, August 21-24, 2000





## ISC Institutional Status



- Papers, Conferences, and Seminars (Continued)
  - Walt Truskowski/588 of the Multi Agent Systems Group presented a paper titled, “A Cybernetic Approach to the Modeling of Agent Communities”, at the CIA 2000 Workshop in Boston, MA, July 7-9, 2000



## ISC Institutional Status



### ➤ Personnel

#### – GSFC Departures

- 582/Alan Cudmore resigned to take a position in industry, August 17, 2000
- 584/Dennis Melvin retired on September 1, 2000
- 588/Karl Mueller resigned to take a position in industry, August 31, 2000

#### – Open Positions

- 581/All Source Mission Director ad closed; Cert received, interviews in progress
- 582/ROB Flight Software Test Engineer - Closed, interviews in process
- 586/Branch Head position ad closed - Cert received, interviews in progress
- 586/Interviewed and forwarded paper work for a potential candidate from KSC for backfilling Sharon Wong on ESDIS



## ISC Institutional Status



### ➤ Personnel (Continued)

#### – Transfers within GSFC

- Teresa LaFourcade transferred from Code 584 to Code 560

#### – New Hires/Conversions

- 582/Louise Brashar new IT hire - onboard August 28, 2000
- 582/Clara Hollenhorst new IT hire - onboard August 14, 2000
- 587/Jocelyn Ingram new Freshout hire - onboard September 11, 2000
- 586/Expecting new Co-op, Jessica Matthews, September 25, 2000
- 588/Expecting new Co-op, Marcella Hopkins, September 25, 2000
- 588/Hired Steve North, a Ph.D. Resident Research Associate (RRA), from University College in London, to assist with our Agent software development - onboard January 2001



## ISC Institutional Status



### ➤ IT Security

- Organized and conducted Internet mission security architecture meetings, with security experts from NASCOM

### ➤ Facilities

- Code 584W is involved in discussions regarding moving the Branch from its current location in Building N161 - No proposed locations yet that are large enough to allow the Branch to remain co-located



## ISC Institutional Status



### ➤ Procurement

- Code 584W major procurements include: Codes 450W and 584W procured a demonstrator system for range control center processing/display

### ➤ ISO 9000 QMS

- Code 584W supported audit preparation activities at WFF for DNV surveillance audit - there were no findings or NCRs affecting branch



## ISC Institutional Status



### ➤ Safety

- Code 584W conducted quarterly safety walk-through - resulting in completion of building power system modifications to allow elimination of 18 foot long extension cord use, elimination of non-RFI outlets near water source, and upgraded lab flooring to eliminate hazardous raised floor tiles



## ISC Good News



- Sandy Bogan/584W received GSFC Customer Service Award for support to Federal Women's Program
- Dennis Small and Cindi Adams/584G received a Special Act Award for serving as program managers for the AETD Minority Mentoring Program
- CFO Awards Ceremony for IFMP & OMNI, September 13, 2000
  - **ISC Recipients**
    - Joe Sparmo, David Matusow, Debbie Sharpe, Corrine Reed-Miller & Tom Weber/585
    - Lisa Dallas/588



## ISC Good News



- Steve Kempler/586 was re-elected as a co-chair of the Products and Services Standing Committee of the Earth Sciences Enterprise Federation
- Luther Lighty/587 presented a paper titled “World Wide Web Access and Storage of the National Centers of Environmental Prediction Reanalysis Data Archives” to complete his PIP II requirements
- Troy Ames/588 Was interviewed about the IRC’s use of XML by CNBC in August 2000





## ISC Good News



- The ISC 2000 Best Paper Award winners are as follows
  - Winner - Jim Rash/588 for his paper entitled "Internet Access to Spacecraft"
  - Runners Up - Troy Ames/588, and Mark Stephens/582, for their papers "Using XML and Java for Telescope and Instrumentation Control" and "Implementation of Multispectral Image Classification on a Remote Adaptive Computer"



# ISC Top Issues



ISR INITIATION DATE	ACTIVITY/ PROJECT EFFECTED	ISSUE	SOLUTION OPTIONS
9/22/00	584	ULDB Flight Software is behind schedule. Initially unstable requirements, a new development environment, lower than optimum staffing/skill mix and technical complexity are contributing factors.	580 review of this at Wallops on September 20, 2000. Recovery plan is in definition.
9/22/00	582	SOMO intent to terminate multi-mission flight software common engineering efforts starting in FY'02 (ROM funds loss of \$1.1M per year). This will impact both on-orbit and in development GSFC mission costs/success and erode flight software core competency.	<ol style="list-style-type: none"> <li>1. Final decision on actual cuts approximately 11/00</li> <li>2. Contacted Codes Y &amp; S to work issue</li> </ol>
9/22/00	580 All	SOMO GSFC Technology Project Manager wants to impose a \$180K to \$200K cut in Code 580 ODIN budget for FY01 and out. SOMO GSFC Technology Project Manager wants to cover a shortfall in his technology program with funds, which were placed in SOMO technology JON for convenience. Impact of this cut is that 580 cannot support approximately 100 of its 320 ODIN seats and severely impacts desktop support. Additionally it sets a precedent for further cuts as long as these funds are in this technology JON. The investment of \$360K to \$400K during the past two fiscal years for these 100 seats is lost if these seats are taken out of ODIN.	Since ODIN is not part of any technology program, work with Code 450 to relocate 580 ODIN funds to other non-technology JON.



## Acronym Listing



<b>AETD</b>	-	<b>Applied Engineering and Technology Directorate</b>
<b>ADAS</b>	-	<b>Airborne Diode Array Spectrometer</b>
<b>ADEOS2</b>	-	<b>Advanced Earth Observing Satellite</b>
<b>AFDIR</b>	-	<b>Advanced Fault Detection Isolation &amp; Recovery</b>
<b>AIAA</b>	-	<b>American Institute of Aeronautics and Astronautics</b>
<b>AISR</b>	-	<b>Applied Information Systems Research</b>
<b>APT</b>	-	<b>Astronomer's Proposal Tool</b>
<b>BSOCC</b>	-	<b>Bowie State Satellite Operations Control Center</b>
<b>CCMC</b>	-	<b>Community Coordinated Modeling Center</b>
<b>CFO</b>	-	<b>Chief Financial Officer</b>
<b>CHIPS</b>	-	<b>Cosmic Hot Interstellar Plasma Spectrometer</b>
<b>CIA</b>	-	<b>Cooperative Information Agents</b>
<b>Co-op</b>	-	<b>Cooperative</b>
<b>CSC</b>	-	<b>Computer Sciences Corporation</b>
<b>CSTAT</b>	-	<b>Cross Spacecraft Trend Analysis Tool</b>
<b>CY00</b>	-	<b>Calendar Year 2000</b>
<b>DNV</b>	-	<b>Det Norske Veritas</b>
<b>EOS</b>	-	<b>Earth Observation System</b>
<b>EOSDIS</b>	-	<b>Earth Observation System Data and Information System</b>
<b>ESDIS</b>	-	<b>Earth Sciences Data and Information System</b>
<b>ESO</b>	-	<b>European Southern Observatory</b>
<b>ESTO</b>	-	<b>Earth Sciences Technology Office</b>
<b>FDS</b>	-	<b>Flight Dynamics System</b>
<b>FSW</b>	-	<b>Flight Software</b>
<b>FTP</b>	-	<b>File Transfer Program</b>
<b>FUSE</b>	-	<b>Far Ultraviolet Spectroscopic Explorer</b>
<b>FY</b>	-	<b>Fiscal Year</b>



## Acronym Listing



<b>GLIN</b>	-	<b>Global Legal Information Network</b>
<b>GOES</b>	-	<b>Geostationary Operational Environmental Satellite</b>
<b>GPS</b>	-	<b>Global Positioning System</b>
<b>GRC</b>	-	<b>Glenn Research Center</b>
<b>GSFC</b>	-	<b>Goddard Space Flight Center</b>
<b>HQ</b>	-	<b>Headquarters</b>
<b>HST</b>	-	<b>Hubble Space Telescope</b>
<b>IDL</b>	-	<b>Interactive Data Language</b>
<b>IEEE</b>	-	<b>The Institute of Electrical and Electronics Engineers, Inc.</b>
<b>IFMP</b>	-	<b>Integrated Financial Management Program</b>
<b>IGARSS</b>	-	<b>International Geoscience and Remote Sensing Symposium</b>
<b>IP</b>	-	<b>Internet Protocol</b>
<b>IR&amp;D/IRAD</b>	-	<b>Institutional Research and Development</b>
<b>IRC</b>	-	<b>Instrument Remote Control</b>
<b>IS</b>	-	<b>Information Science</b>
<b>ISC</b>	-	<b>Information Systems Center</b>
<b>ISO</b>	-	<b>International Organization for Standardization</b>
<b>ISS</b>	-	<b>International Space Station</b>
<b>IT</b>	-	<b>Information Technology</b>
<b>JPL</b>	-	<b>Jet Propulsion Laboratory</b>
<b>KSC</b>	-	<b>Kennedy Space Center</b>
<b>NASA</b>	-	<b>National Aeronautics and Space Administration</b>
<b>NASCOM</b>	-	<b>NASA Communication Division</b>
<b>NCR</b>	-	<b>Non Conformance Report</b>
<b>NGST</b>	-	<b>Next Generation Space Telescope</b>
<b>NMS</b>	-	<b>NGST Mission Simulator</b>
<b>NOAA</b>	-	<b>National Oceanic and Atmospheric Administration</b>
<b>NRA</b>	-	<b>NASA Research Announcement</b>



## Acronym Listing



<b>ODIN</b>	-	<b>Outsourcing Desktop Initiative for NASA</b>
<b>OMNI</b>	-	<b>Operating Missions as Nodes on the Internet</b>
<b>PIP</b>	-	<b>Professional Intern Program</b>
<b>POES</b>	-	<b>Polar Operational Environmental Satellites</b>
	-	<b>Portable Operating System for Computer Environments or</b>
<b>POSIX</b>	-	<b>Portable Operating System Interface (UNIX)</b>
<b>QMS</b>	-	<b>Quality Management System</b>
<b>RFI</b>	-	<b>Radio Frequency Interference</b>
<b>ROB</b>	-	<b>Reassignment Opportunity Bulletin</b>
<b>ROSS</b>	-	<b>Rewritable Optical Storage System</b>
<b>RRA</b>	-	<b>Resident Research Associate</b>
<b>RTOS</b>	-	<b>Real Time Operating System</b>
<b>SEA</b>	-	<b>Scientist's Expert Assistant</b>
<b>SIECA</b>	-	<b>Summer Institute in Engineering and Computer Applications</b>
<b>SHARC</b>	-	<b>Shareware Archive</b>
<b>SHARP</b>	-	<b>Summer High School Apprenticeship Research Program</b>
<b>SMEX</b>	-	<b>Small Explorer</b>
<b>SOFIA</b>	-	<b>Stratospheric Observatory for Infrared Astronomy</b>
<b>SOMO</b>	-	<b>Space Operation Management Office</b>
<b>STScI</b>	-	<b>Space Telescope Science Institute</b>
<b>SWV</b>	-	<b>Space Weather View</b>
<b>TCP</b>	-	<b>Transmission Control Protocol</b>
<b>XML</b>	-	<b>Extensible Markup Language</b>
<b>ULDB</b>	-	<b>Ultra Long Duration Balloon</b>
<b>USRA</b>	-	<b>Universities Space Research Association</b>
<b>USU</b>	-	<b>Utah State University</b>
<b>VOLT</b>	-	<b>Visual Observation Layout Tool</b>
<b>WWF</b>	-	<b>Wallops Flight Facility</b>